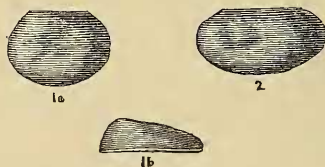


XXXVI.—Notes on the Palaeozoic Bivalved Entomostraca.—

No. XV. *A Carboniferous Primitia from South Devon.* By
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IN June last Mr. J. E. Lee, F.G.S., of Torquay, having discovered two casts of small Entomostraca in the red schist of the Lower Culm-measures of South Devon, sent them to me for examination. He had found one of the few patches of Culm-stone left by denudation in that region at Lord Clifford's farm, Waddon-Barton; and before the place was bricked up he removed a cart-load of the stone to his own residence. It proved to contain *Orthoceras striolatum* and *Goniatites*, with a small *Pecten*, *Posidonomya* (rare), *Cylindraspis* (also rare), and the two little fossils here referred to. These interesting specimens are two internal casts of one species of *Primitia*, lying at nearly a right angle one to another, on a roughish bed-plane of hard, purplish-red, schistose mud-stone. They have suffered somewhat from lateral pressure. One (fig. 1), 2.5 millim. long, has been probably rather shortened; and



Casts of a *Primitia* from the Lower Culm of South Devon.

Fig. 1 *a*.—Internal cast of a right valve; possibly somewhat shortened by pressure.

Fig. 1 *b*.—Edge view of the same, showing the posterior convexity.

Fig. 2.—Internal cast of a right valve, much elongated by pressure.

All magnified 5 diameters.

the other (fig. 2), 3 millim., has decidedly been lengthened and attenuated by the squeeze to which the rock has been subjected since the imbedding of the organisms. The figures represent them magnified five diameters.

Some obscure traces of other fossils, and many minute cavities due to the former presence of organic remains, occur on the same rough bed-plane which bears the two casts. Many similar little holes, along nearly regular lines, parallel with that plane and with the schistose structure, are visible on a face of fracture perpendicular to the bed-plane of the old mud-stone.

Of the two Entomostracan casts (internal moulds) the shorter form has a squarish Leperditoid outline, with a centro-dorsal depression (fig. 1 *a*) and a marginal rim and furrow along the ventral border (fig. 1 *b*). The surface of the cast is smooth, and its convexity is greatest in the posterior half (fig. 1 *b*). The other specimen has these features modified by the pressure which has affected it crosswise from ventral to dorsal region.

It is usually difficult to determine the species of *Primitia* (see 'Monograph Silur. Fossils of Girvan,' by Nicholson and Etheridge, fasc. ii. 1880, p. 221), and hazardous to attempt the specific allocation of their shell-less casts. At first sight this *Primitia* has much resemblance to *P. prunella*, Barrande (Syst. Silur. Bohême, vol. i. Suppl. p. 550, pl. xxvi. figs. 5 and 6), and to *P. Fischeri*, Ehlert (Bull. Soc. Géol. France, ser. 3, vol. v. p. 584, pl. ix. fig. 5); but its edge view (fig. 1 *b*) gives a different profile, and, instead of being symmetrically and gently convex, is much elevated or swollen behind and depressed in front, like that of *P. Barrandiana* (not well drawn in fig. 11, *e*, pl. xv. 'Girvan Fossils,' 1880). Indeed the valve of the variety of *P. Barrandiana* shown in fig. 11 *c* (*op. cit.*) approximates very closely in form to the cast before us (fig. 1 *a*). The latter, however, has not so deep a dorsal sulcus as some internal casts of *P. Barrandiana* from Girvan exhibit.

To refer our Carboniferous *Primitia* from Devon to a Lower-Silurian species may be regarded as bold and heterodox; but some Ostracodous Entomostraca (so far as valves bear evidence) are already known to range from the Silurian to the Carboniferous system (for example, *Beyrichia intermedia*, see Ann. & Mag. Nat. Hist. ser. 4, vol. xv. p. 55), and others from Silurian and Carboniferous strata appear to be undistinguishable (see Geol. Mag. dec. 2, vol. viii. p. 74).

A very fine Leperditoid *Primitia* is known from the Lower-Carboniferous strata of Brunton, near Chollerford, in Northumberland, namely *P. Tatei*, Jones (described as a *Beyrichia* in 1863, see Proc. Berwicksh. Naturalists' Club for 1864, p. 88, fig. 3). Its more ovate outline and more symmetrical and central convexity distinguish it from the Devonshire species; and its very *Leperditia*-like shape, its neatly defined dorsal sulcus, and its acutely ovate edge view separate it from the other *Primitiæ* mentioned above.

Doubtless all these *Primitiæ* were closely related, however wide apart their habitats and however long the period through which they existed. Their exact points and degrees of rela-

tionship cannot be defined by means of the valves alone without the organs; still less can casts satisfy us in this matter.

With regard to Mr. J. E. Lee's rare little specimens from Devon, in the absence of their valves we can do no more than refer them to the genus *Primitia*, defined in the Ann. & Mag. Nat. Hist. ser. 3, vol. xvi. p. 415, and point out that apparently their closest ally is the Lower-Silurian *P. Barrandiana*. It is, however, just possible that, had the casts not been modified by lateral pressure, fig. 1 *a* might have been much more Leperditoid and like *P. Tatei*, whilst the posterior convexity in fig. 1 *b* may have been increased, if not brought about, by the same cause. Under these circumstances it is not advisable to venture on a specific determination.

XXXVII.—*Note on Rhacodes inscriptus, Koch, and Armadillo officinalis, Duméril, terrestrial Isopoda.* By the Rev. A. E. EATON, M.A.

DR. A. GERSTÄCKER, in a recently published part of Bronn's 'Klassen und Ordnungen des Thier-Reichs,' Bd. v. Abth. ii. p. 209, brackets *Rhacodes*, Koch, as a synonym of the genus *Tylos*, Latreille. As this combination, if unobjected to, is liable to cause trouble, it may be well to notify that the characters attributed by him to the genus apply in essential particulars to *Tylos* exclusively.

Rhacodes inscriptus, Koch, described in Rosenhauer's 'Die Thiere Andalusiens,' p. 422 (1856), is a woodlouse very nearly akin to *Armadillidium*, Brandt and Ratzeburg (1833), judging from the make of its head and antennæ, its tail-segments, their modified legs, and their breathing-organs; and in these distinctive structures it exhibits no affinity with *Tylos*. Koch's description is sufficient for the recognition of the animal. The most obvious difference between it and *Armadillidium* is in the eyes: those of this latter genus are multiple, whilst *Rhacodes* has only a single unfaceted eye on each side of its head. The species was found by Rosenhauer near Malaga at the end of April, not uncommonly. I have met with it in Portugal, near Porto, and at Ponte de Morcellos, in Beira Baixa, at altitudes of from 30 to 600 feet above the sea; also in Madeira, where it is common at altitudes of 2500–5450 feet. In the Hope Museum at Oxford are four examples, collected in the same island by the late Mr. Wollaston, without indications of altitude.